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Utility Patent Application Transmittal
(Only for new non-provisional applications Under 37 CFR 1.53(b))

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Washington, D. C. 20231

Case Docket No. 0325.00281
Date: November 5, 1999

Sir:

Transmitted herewith for filing is a patent application of:

Inventor(s): Lane T. Hauck

For: APPARATUS AND METHOD FOR CONTROLLING AN ELECTRONIC PRESENTATION

Enclosed are:

1. X Specification (14 pages); Claims (5 pages); Abstract (1 page)

2. X _3_ sheets of formal drawings.

3. X Oath or Declaration   Total Pages _2_
    a. _X_ Newly executed (original or copy)
    b. ___ Copy from a prior application (37 CFR 1.63(d))
         (for continuation/divisional with Item 5 completed)
    c. ___ Copy of Revocation of Previous Power

4. ___ Incorporation By Reference (usable if Item 3b is checked)
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Item 3b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

5. ___ If a Continuing Application, check appropriate box and supply the requisite information below and in a preliminary amendment:

    ____ Continuation   _____ Divisional   _____ Continuation-in-part (CIP)
of prior application no.: _____

6. X An assignment to CYPRESS SEMICONDUCTOR CORP. along with PTO form 1595.

7. ___ A PTO Form 1449 with a copy of the references not previously cited.

8. X Return Receipt Postcard

9. ___ Other:

The filing fee has been calculated as shown below:

	No. Filed	No. Extra	Fee	Amount
Basic Fee	--	--	--	$760.00
Total Claims	20	0	x $ 18.00	$ 0.00
Indep. Claims	3	0	x $ 78.00	$ 0.00
Mult. Dep. Claims			$260.00	$ 0.00

SUB-TOTAL $760.00

__ SMALL ENTITY STATUS (divide SUB-TOTAL by two) . . . . . . $_____

X Assignment Recordal Fee ($40.00) . . . . $ 40.00

TOTAL $800.00

X A check in the amount of $800.00 to cover the filing fee is enclosed.

X The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper or associated with this filing to Deposit Account No. 50-0541. A duplicate copy of this sheet is enclosed.

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PATENT TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service via Express Mail Label No. EL417953024US in an envelope addressed to: BOX PATENT APPLICATION, Assistant Commissioner for Patents, Washington, D.C. 20231, on November 5, 1999.

By: _Mary Donna Berkley_
(Mary Donna Berkley)

Respectfully submitted,

By _____

Date: November 5, 1999

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APPARATUS AND METHOD FOR CONTROLLING AN ELECTRONIC PRESENTATION

Field of the Invention

The present invention relates to presentation devices

5 generally and, more particularly, to an apparatus and method for

controlling an electronic presentation.

Background of the Invention

Giving presentations can be an anxious experience. The

10 anxiety level of giving a presentation can increase when the

presentation is given electronically (e.g., using a personal

computer running a presentation software package such as PowerPoint

or other presentation software).

To a presenter not thoroughly familiar with the operation

15 of the presentation software, it may not be intuitive how to

perform the basic task of advancing to the next slide. For

example, in PowerPoint advancing to the next slide is accomplished

by pressing the left mouse button, or one of several keyboard keys.

Inadvertently pressing the right mouse button or other keyboard

20 keys can ruin the presentation by backing up, or worse, exiting the

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PowerPoint program entirely. Such an error can lead to a flurry of activity, where the presenter often must ask a member of the support staff (or worse the audience) for assistance in resuming the presentation. Such an interruption disrupts the presentation

5 flow and embarrasses the presenter.

Conventional approaches to minimizing errors during a presentation include accessory devices that have been designed and built to attempt to make delivery of an electronic slide show smooth and foolproof. An example of such a device includes

10 wireless remote controls that use an infrared beam similar to a TV remote control. These devices usually attach to the PC through a serial port, and require special "driver" software to translate commands from the port to emulate keystroke or mouse commands that are recognizable by the presentation software. The driver software

15 limits the use of such devices to pre-prepared computers, on which the driver software has been installed. In addition, these devices tend to be complex, to allow many options. Therefore they present a whole new set of "learning curve" challenges to the presenter, and thus may defeat the goal of being simple and foolproof.

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Summary of the Invention

The present invention concerns an apparatus comprising a first device and a bus interface. The first device may be configured to present one or more control signals in response to one or more input instructions. The bus interface may be configured to (i) receive the one or more control signals and (ii) provide power to the device. One aspect of the present invention may include a program configured to either advance or retreat through a plurality of slides in response to the one or more control signals. Another aspect of the invention may include a second device configured to (i) run the program and (ii) communicate through the bus.

The objects, features and advantages of the present invention include implementing an apparatus and/or method that may (i) present simple options to the presenter (e.g., advancing to the next slide of an electronic presentation), (ii) eliminate the presentation of complex options that have the potential for misuse to the presenter (iii) connect to any PC (or Macintosh) without the necessity of pre-installing driver software, (iv) be capable of "hot-plugging" into a computer (e.g., if a spur-of-the-moment decision is made to use the control, the control may be plugged in

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and activated without re-booting the computer), and/or (v) provide

feedback to the presenter in a non-obtrusive manner.

Brief Description of the Drawings

5   These and other objects, features and advantages of the

present invention will be apparent from the following detailed

description and the appended claims and drawings in which:

         FIG. 1 is a perspective view of a preferred embodiment of

the present invention; and

10   FIG. 2 is a block diagram of a preferred embodiment of

the present invention implemented in the context of a personal

computer environment;

         FIG.3 is a schematic diagram of a preferred embodiment of

the present invention; and

15   FIG. 4 is a flow chart of the operation of the present

invention.

Detailed Description of the Preferred Embodiments

         Referring to FIG. 1, a perspective view of a device 100

20 is shown in accordance with a preferred embodiment of the present

invention.   The device 100 comprises a housing 102, a number of

pushbuttons 104a-104n, a control circuit 106, a cable 107, a vibrator assembly 108 and a connector 110. The housing 102 generally contains the pushbuttons 104a-104n and internally contains the control circuit 106. The device 100 may be

5   implemented as USB (Universal Serial Bus) peripheral device. The vibration assembly 108 may be implemented with a small motor and may be configured to vibrate when power is applied. The device 100 may be attached to a host computer, such as a PC or Macintosh, through the connector 110. The connector 110 may be, in one

10   example, a USB connector that may draw power from a bus such as a USB bus. The vibrator assembly 108 may be of the type commonly used in pagers and cell phones. While the device 100 has been described generally in the context of a USB environment, the device 100 may be implemented in the context of other environments that

15   may be appropriate to meet the design criteria of a particular implementation.

The device 100 may provide a simple control that may avoid the presentation complex options to the presenter. The device 100 may, in one example, provide one or more control signals

20   that may control the advancing or retreating of the next slide of an electronic presentation software package. The device 100 may

avoid the requirement for complex instructions that may have the

potential for misuse. The device 100 may be connected to a

computer (such as a PC or a Macintosh) and may operate without the

necessity of pre-installing driver software. The device 100 may

5   have the ability to "hot-plug" into the computer. The ability to

hot-plug the device 100 may enable spur-of-the-moment decisions

since the device 100 may be plugged in and activated without re-

booting the computer.

In one implementation, the device 100 may provide

10   feedback to the presenter in a non-obtrusive manner. For example,

if the presenter wishes to know that the next slide is available

(there can be a significant delay between slides, particularly if

the slides are rich in graphics and require long disk accesses),

the device 100 may give the presenter unobtrusive feedback when the

15   next slide is fully loaded and ready for presentation. In another

implementation, if an assistant wishes to help pace a presentation

by alerting the presenter that time is running low, an indication

may be given by having the assistant press a key on the keyboard of

the presentation computer. If an assistant presses the CAPS lock

20   key (e.g., key 206a or any other predefined key) the vibrator

assembly 108 may be activate, inconspicuously alerting the

presenter.

Referring to FIG. 2, a more detailed diagram of the

device 100 is shown implemented with a computer 200. The cable 107

5   may be implemented, in one example, as a standard USB cable. The

cable 107 may connect the device 100 with the computer 200. To

operate with the device 100, the computer 200 must generally be

equipped with a USB port or other appropriate port.

The computer 200 may have an USB port 202 and a keyboard

10   204. The keyboard 204 may have a plurality of keys 206a-206n and

an LED 208. In one example, the LED 200 may be implemented as a

"CAPS lock indiction light". However, the LED 208 may be

implemented as any type LED in order to meet the criteria of a

particular implementation. A Page-Up (PgUP) key 206b and a Page-

15   Down (PgDN) key 206c may be implemented to control an electronic

presentation program. However, alternate keys may be implemented

to control the electric presentation program. The control circuit

106 may contain firmware code that may be written to accommodate

any of keys 206a-206n. When the user is running a presentation

20   program on the computer 200, tapping the PgDN key 206 may advance

to the next slide and tapping the PgUP key 206c may go back (e.g.,

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retreat) one slide. One hazard of using the keyboard 204 to control the presentation is that if the user inadvertently holds down the key 206b or the key 206c too long, an "auto-repeat" function of the keyboard 204 may be activate. The auto-repeat

5   function may rapidly advance and/or retreat through the remaining slides rather than moving one slide forward or backward. The device 100 may prevent the auto-repeat function.

The control circuit 106 may be implemented as a microprocessor that may include, in one example, a USB port 112.

10   Although the USB port 112 may be implemented externally to the microprocessor 106 in some implementations, it may be advantageous in size and/or cost to use a single-chip solution that may contain both the microprocessor 106 and the USB port 112. An example of a dual implementation of the microprocessor 106 and the USB port 112

15   may be accomplished with the Cypress Semiconductor CY7C63000A microprocessor, the data sheet of which is hereby incorporated by reference in its entirety. The microprocessor 106 may include an EPROM (not shown) that may store the firmware that may contain the instructions necessary to operate the device 100. The

20   microprocessor 106 may have a number of inputs 114a-114n and an output 116. The input 114a may receive a signal from a forward

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button 104a.   The input 114n may receive an input from a reverse

button 104n.   The vibrator assembly 108 may be connected to the

output 116, through a transistor switch 120.   Because the USB cable

107 may provide a source of 5 volt power, the USB cable 107 may

5   power the device 100.   The USB cable 107 may eliminate a need for

batteries or any other power sources.

In operation, when a presentation program is running on

the computer 200, and the user presses the FWD button 104a, the

firmware stored in the microprocessor 106 may send, over the USB

10   cable 107, data which may simulate pressing the PgDN key 206c on

the keyboard 204.   Similarly, when the user presses the REV button

104n, the firmware stored in the microprocessor 106 may send, over

USB cable 107, data which may simulate activation of the PgUP key

206b on the keyboard 204.   In this way control of the delivery of

15   an electronic slide show may be provided by the device 100.   As

shown   in   the   program   flowchart   (to   be   described   in   detail   in

connection with FIG. 4), the FWD button 104a and REV button 104n

may provide improved performance over the keyboard buttons 206a-

206n, since the buttons 104a and 104n may be pressed indefinitely,

20   without the auto-repeating function of the presentation software.

An advantage of using the USB device 100 is that the buttons 104a

and 104n may operate simultaneously with the keys 206a-206n. Such

simultaneous operation may allow the presentation software to be

controlled from either source or both sources simultaneously.

　　　　The device 100 may provide unobtrusive feedback to the

5　　slide show presenter using the invention by means of the vibrator

assembly 108. The vibrator assembly 108 may be activated by the

microprocessor 106 via the transistor switch 120 whenever a

keyboard light (for example the CAPS lock light) is on. The CAPS

lock key 206a and/or 206n may be pressed by an assistant positioned

10　　at the computer 200, who wishes to alert the presenter that it is

time to move on to the next slide. Alternatively, the CAPS lock

light 208 may be activated in an automated manner, such as by a

programmed timer in the presentation program software which turns

on the CAPS lock light 208 after a predetermined time for each

15　　slide. When the CAPS lock key 206a is pressed, either physically

or under software control, the computer 200 may turn on the CAPS

lock light 208 on and simultaneously send a message over the USB

cable 107. The message may indicate that the CAPS lock light 208

is on. The microprocessor 106 may be configured to interpret such

20　　an event and may turn on the transistor switch 120 to activate the

vibrator assembly 108. Similarly, when the CAPS lock key 206a is

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pressed a second time, the computer 200 may turn off the CAPS lock

light 208. The computer 200 may simultaneously send a message over

the USB cable 107 indicating that the CAPS lock light 208 is off,

which may cause the microprocessor 106 to turn off the vibrator

5   assembly 108.

Referring to FIG.3, a schematic diagram of the device 100

is shown. A capacitor 300 and a capacitor 302 may provide power

supply decoupling. A resistor 304 is generally required by a USB

compliant device to indicate the presence of a low speed device.

10   A resonator 306 may provide a time base (e.g., 6 MHz or other

appropriate time base) for the microprocessor 106. A resistor 304

may provide base current limiting for the switch 120, which may act

as a current amplifier for the vibrator 108. The switch 120 may be

implemented, in one example, as a BJT transistor. A resistor 310

15   may provide current limiting for the vibrator 108. A diode 312 may

provide voltage protection for the switch 120, a technique commonly

used when switching an inductive load such as the vibrator 108.

The USB cable 107 may attach to the USB port 110.

Referring to FIG. 4, a flowchart of the operations

20   performed by the firmware code stored in the microprocessor 106 is

shown. The device 100 is plugged into a USB port at a state 400,

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that may cause a state 401 to enumerate the device 100 as a USB "HID" (Human Interface) device. An example of device enumeration may be found in co-pending applications Serial No. 08/886,923 and Serial No. 09/232,578 that are each hereby incorporated by reference in their entirety. The advantage of enumerating as a HID device is that the device driver to operate the device is generally included as a standard part of the operating system of the computer 200. A user plugging in the device 100 for the first time may not need to supply a floppy disk or CDROM with a special driver program.

An endless loop is then entered at the state 402, where a USB bus is checked for activity. According to the USB specification (e.g., USB Specification 1.1, published September 1998, which is hereby incorporated by reference in its entirety), after 3 milliseconds of inactivity, a USB device generally enters a low power suspend state 405. After the suspend state 405, a state 406 generally checks for resumption of USB activity. If USB activity is detected the software enters a state 407 to resume program execution, re-entering the main loop at the state 403. If the bus continues to be inactive, the state 406 continues to loop, waiting for activity.

If the bus is active at the state 402, the state 403 generally checks the control endpoint for a "SET_REPORT" message, which is generally used by the host to transmit the states of the keyboard lights. If the SET_REPORT message is found, the state 408

5   generally updates the output bit which activates the vibrator assembly 108 (e.g., see FIGS. 1-3), and returns control to the state 404. The state 404 then determines if either of the buttons is pressed, and if so proceeds to the state 409. If no buttons are pressed, the state 404 enters the main program loop at the state

10 402.

The state 409 determines which button is pressed where the state 410 sends the Page Down keycode, and the state 411 sends the Page Up keycode. Both the state 410 and the state 411 proceed to the state 412, where the key-up code is generally sent.

15 Transmission of the key down code immediately followed by the key-up code may ensure that the computer 200 will not auto-repeat.

The microprocessor 106 is generally programmed to implement the USB "HID" standard such as the Device Class Definition For Human Interface Device (HID), version 1.1, published

20 April 4, 1999, that is hereby incorporated by reference in its entirety. This allows the control to function as a standard

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keyboard known to the operating system, and therefore the control requires no special driver code to be loaded into the computer 200. Further, the microprocessor 106 may be programmed to implement a standard keyboard HID function, with the pushbuttons 104a-104n

5   acting as the keyboard key normally used to advance an electronic presentation to the next slide. The microprocessor 106 may be programmed to recognize the command sent to all keyboards which turns on and off the "Caps Lock" or similar keyboard LED. When such an indication is received, the microprocessor 106 generally

10 applies power to the vibrator assembly 108 and thus unobtrusively alerts the presenter whenever an assistant at the presenting PC keyboard presses the Caps Lock (or similar) key. The microprocessor 106 may also be programmed to activate the vibrator assembly 108 on an automated basis (e.g., when the next slide is

15 available for display).

While the invention has been particularly shown and described with reference to the preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made without departing from the spirit

20 and scope of the invention. For example, the present invention may

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incorporate a laser pointer that may also be powered along with the

device 100.

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CLAIMS

1.   An apparatus comprising:

a first device configured to present one or more control signals in response to one or more input instructions; and

a bus interface configured to (i) receive said one or more control signals and (ii) provide power to said device.

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2.   The apparatus according to claim 1, further comprising:

a program configured to either advance or retreat through a plurality of slides in response to said one or more control signals.

5

3.   The apparatus according to claim 2, further comprising:

a second device configured to (i) run said program and (ii) communicate through said bus.

4.   The apparatus according to claim 1, wherein said bus interface comprises a Universal Serial Bus (USB) bus interface.

5.   The apparatus according to claim 1, wherein said bus interface comprises a wireless link between said first device and said second device.

6.   The apparatus according to claim 2, wherein said program is an electronic presentation program.

7.   The apparatus according to claim 3, wherein said second device is configured to control said program in addition to said first device.

8.   The apparatus according to claim 6, wherein said second device is a computer.

9.   The apparatus according to claim 7, wherein said first device is configured to be hot-plugged to said computer at any time, even while said computer is running, wherein said device is immediately available for use without re-booting or re-powering said computer.

10.   The apparatus according to claim 1, wherein said one or more input instructions are generated by a presenter.

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11.   The apparatus according to claim 1, wherein said one or more input instructions are generated in response to one or more buttons.

12.   The apparatus according to claim 1, wherein said first device is configured to operate without user-installed driver software.

13.   The apparatus according to claim 10, wherein said second device further comprises an alert indicator.

14.   The apparatus according to claim 13, wherein said alert indicator comprises either a visible indicator or a vibrator.

15.   The apparatus according to claim 1, wherein said apparatus further comprises a laser pointer.

16.   A method for controlling a presentation comprising the steps of:

(A) generating one or more control signals in response to one or more input instructions;

5   (B) receiving said one or more control signals; and

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(C) providing power over a bus.

17. The method according to claim 16, further comprising the step of:

either advancing or retreating through a plurality of slides in response to said one or more control signals.

18. The method according to claim 17, further comprising the step of:

running said program and communicating through said bus.

19. The method according to claim 16, wherein said method is implemented using a Universal Serial Bus (USB) bus interface.

20. An apparatus comprising:

a device configured to (i) control an electronic presentation program and (ii) communicate through a bus, wherein said electronic presentation program comprises a plurality of

5   slides; and

a computer configured to (i) run said electronic presentation program and (ii) communicate through said bus, wherein

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said device is configured to either advance or retreat through said

plurality of slides and simultaneously to allow said computer to

10   control said electronic presentation program.

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ABSTRACT OF THE DISCLOSURE

An apparatus comprising a first device and a bus interface. The first device may be configured to present one or more control signals in response to one or more input instructions. The bus interface may be configured to (i) receive the one or more control signals and (ii) provide power to the device.
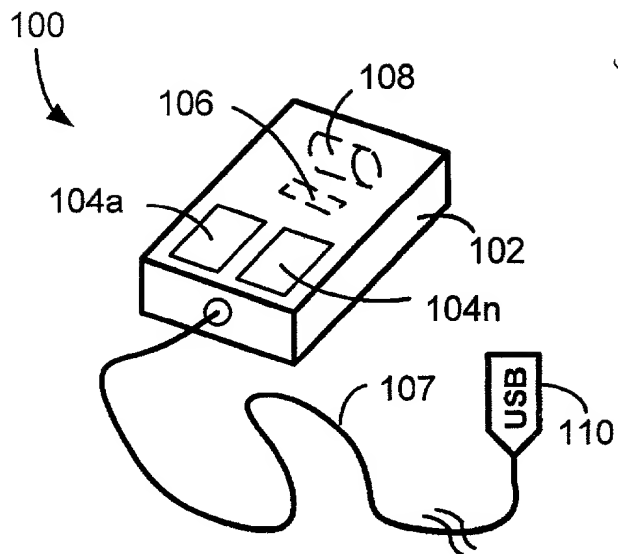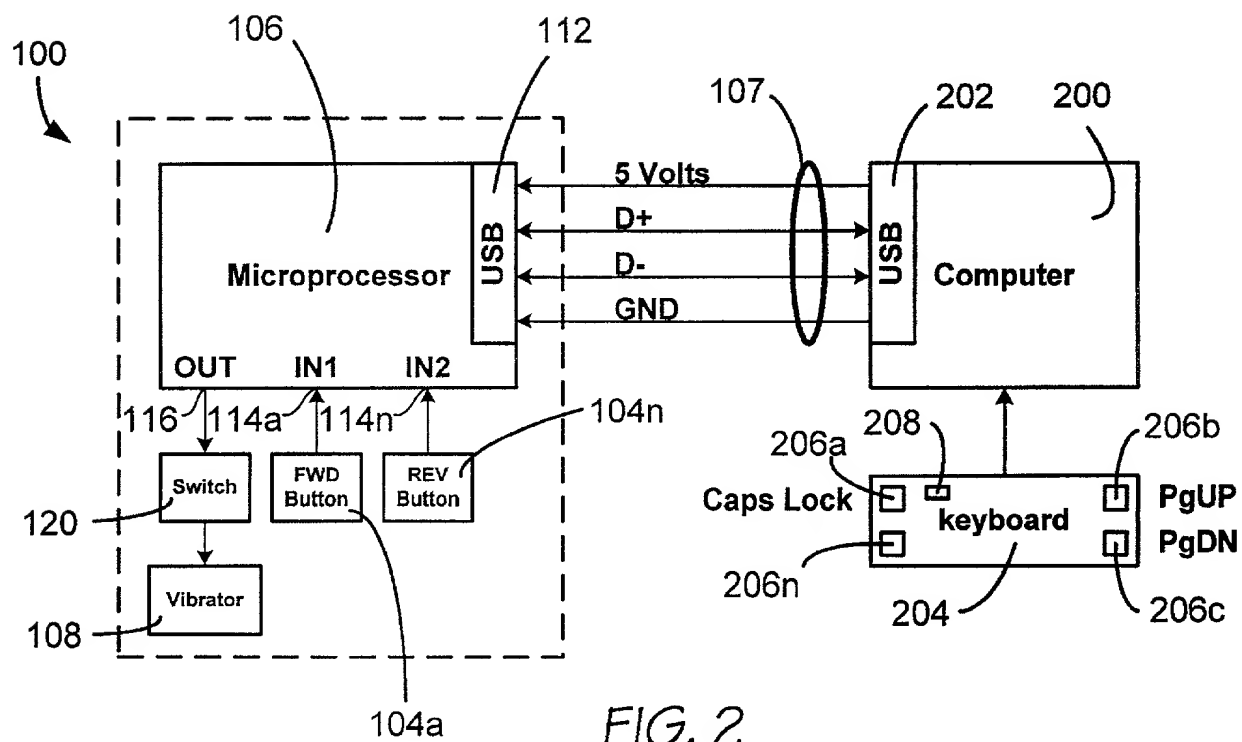
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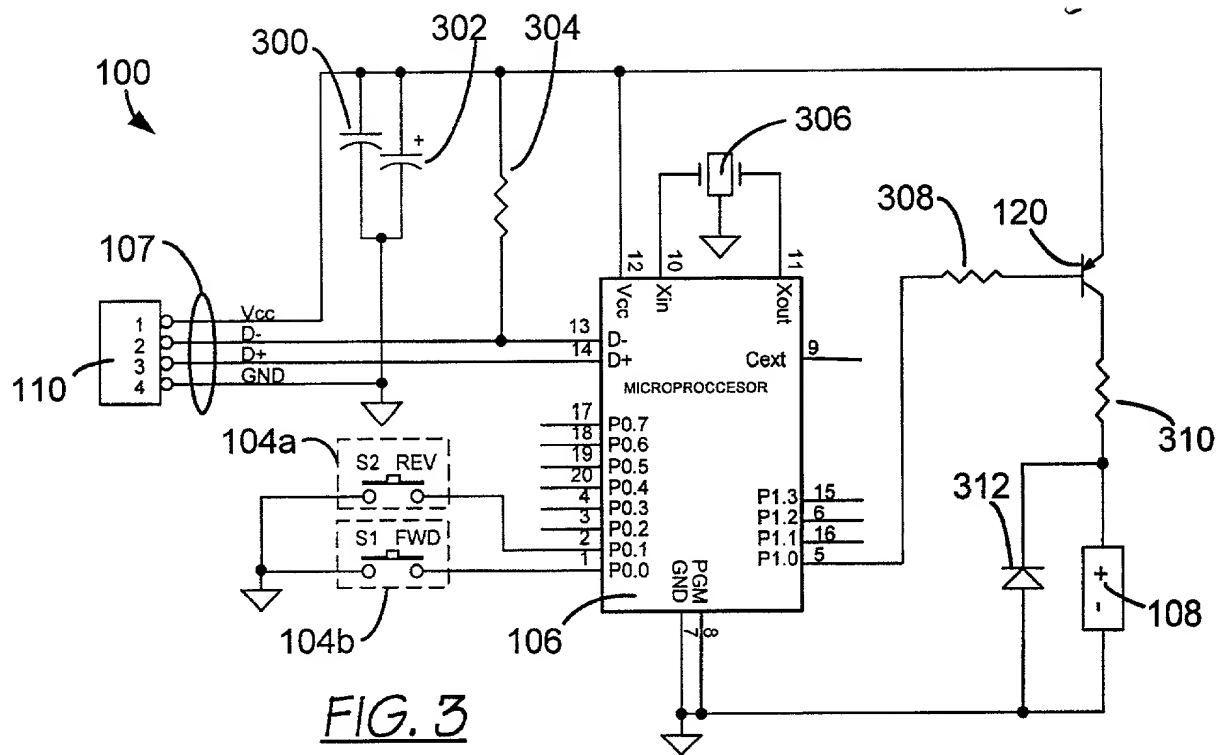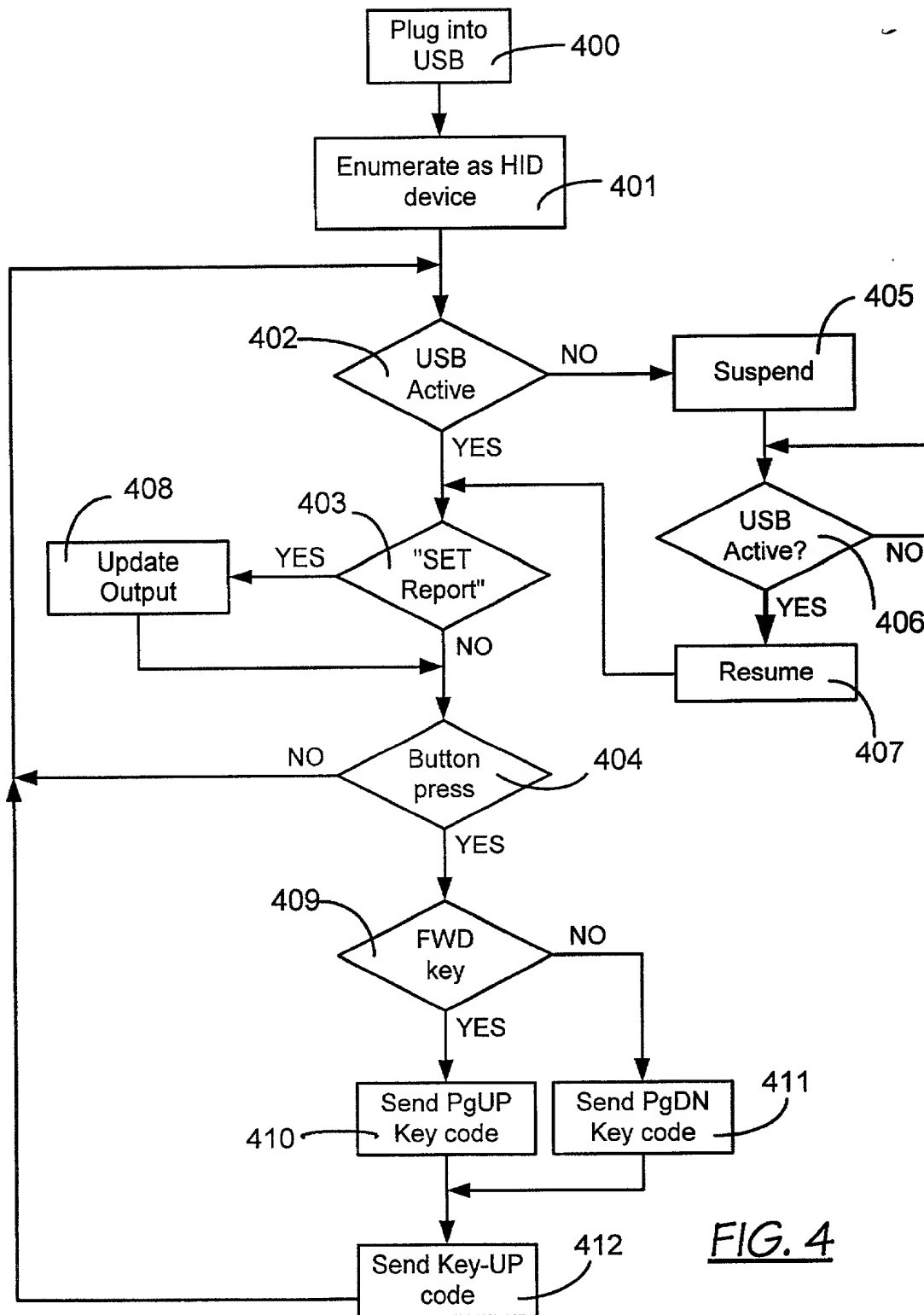_FIG. 1_

FIG. 2

FIG. 3

FIG. 4

Docket No. <u>0325.00281</u>

DECLARATION, POWER OF ATTORNEY AND PETITION

I, the undersigned inventor, hereby declare that:

My residence, post office address and citizenship are given next to my name;

I believe that I am the first, original and sole inventor of the subject matter claimed in the application for patent entitled **"APPARATUS AND METHOD FOR CONTROLLING AN ELECTRONIC PRESENTATION"**, which:

    <u>X</u>   is submitted herewith;

    <u>   </u>   was filed on <u>   </u> as Application Serial No. <u>   </u> and amended on <u>   </u>;

I have reviewed and understand the contents of the above-identified application for patent (hereinafter, "this application"), including the claims;

I acknowledge the duty under Title 37, Code of Federal Regulations, Section 1.56, to disclose to the United States Patent and Trademark Office information known to be material to the patentability of this application. I also acknowledge that information is material to patentability when it is not cumulative to information already provided to the United States Patent and Trademark Office and when it either

    compels, by itself or in combination with other information, a conclusion that a claim is unpatentable under the preponderance of evidence standard, giving each term in the claim its broadest reasonable construction consistent with the application, and before any consideration is given to evidence which may be submitted to establish a contrary conclusion of patentability, or

    refutes or is inconsistent with a position taken in either (i) asserting an argument of patentability, or (ii) opposing an argument of unpatentability relied on by the United States Patent and Trademark Office;

I hereby claim the priority benefit under Title 35, Section 119(e), of the following United States provisional patent applications:

<u>Application No.</u>   <u>Filing Date</u>

I hereby claim the priority benefit under Title 35, Section 120, of the following United States patent applications:

<u>Serial No.</u>   <u>Filing Date</u>   <u>Status</u>

I hereby claim the priority benefit under Title 35, Section 365(c), of the following PCT International patent applications designating the United States:

Application No.   Filing Date

Where the subject matter of the claims of this application is not disclosed in the United States or PCT priority patent applications identified above, I acknowledge the duty to disclose information known to be material to the patentability of this application that became available between the filing dates of this application and of the priority United States or PCT patent applications.

I hereby appoint as my attorneys with full power of substitution to prosecute this application and conduct all business in the United States Patent and Trademark Office associated with this application: Customer No. 021363.

021363

PATENT TRADEMARK OFFICE

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

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